

# *CORE KEYHOLE DRILLING*

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# AGENDA

- Introduction
- Definitions
- Benefits
- Explanations
- Virginia Beach Process
- Material Requirements
- Example Photos
- Old 1X1
- New 12" Core Keyhole
- 18 & 24 inch also available
- Other municipalities are allowing it
- Questions

**Core Keyhole Drilling** is a specialized technique used primarily in utility and infrastructure work to access buried systems with minimal surface disruption.

# What Is Core Keyhole Drilling?

- Core keyhole drilling involves creating a small, precise circular hole—typically 12", 18", or 24" in diameter—through hard surfaces like asphalt or concrete. This is done using a **rotary core drill** that cuts a clean cylindrical section (called a “coupon”) from the pavement. The goal is to **remove and later reinstate** this core after underground work is completed.

## Traditional Method vs. Keyhole Coring



# Definitions

- i) ii) Keyhole coring: The operation of coring a circular hole through the roadway, apron or sidewalk pavement using diamond core drilling equipment. The removed core is returned and bonded in place. Test hole: Maximum dimension of 12" (length or width), PW Design Standards Manual Detail C-12. Penetration of paved surface with intent to locate existing infrastructure and/or observe passing of direct bury push rod and utility pull back. Synonyms: pothole; test pit; spot hole iii) Open Cut: Any cut opening in pavement. Must be specified, with detailed location information, on permit site plan for approval. Keyhole is blanket approved for open cuts to 12" circular. Larger size cuts will require PW Engineering approval. iv) Inspector: The cognizant department construction inspector assigned to a project for constructing CIP or developer projects. Synonyms: Project Inspector (PU DSM); City's Inspector (PW DSM)

## Benefits for the Crew

- **Easy to Operate:** No extensive training required to operate the coring unit.
- **Easy on the Back:** Eliminate the need for jack-hammers, shovels and backhoes, which reduces potential for workplace injury.
- **Easy to Use:** Utilibond™ is packaged in easy-carry, easy-open, pre-measured pails. Just add water to the line, mix and pour into the hole.
- **Safe:** Work-safe engineered equipment and non-hazardous bonding materials.
- **Reliable:** The only purpose-built, coring equipment capable of quickly cutting through all types of road systems and sidewalks with a minimum of effort.

# Benefits for the Community

- **Reduced Traffic Disruption:** Permanent pavement repair means reduced traffic disruption with fewer and shorter road closings and no repeat visits.
- **Saves Tax Dollars:** Less structural damage to road system which results in longer pavement life and reduced maintenance, saving millions in tax dollars.
- **Reduced Carbon Footprint:** Keyhole coring and reinstatement emits less than ONE-SIXTH of the amount of green house gases than conventional methods.
- **Cleaner, Safer, Less Intrusive Worksite:** No jackhammers or large excavation equipment means less noise and mess and reduced disruption for neighbors.



# Benefits of Core Drilling

- **Saves Money:** Dramatically reduces paving budgets. Saves up to \$1,000 per hole or \$1 million or more per year vs. traditional cut and repair methods.
- **Positive Community Relations:** Fewer complaints from municipalities about traffic disruption, unsightly road cuts, sunken patches or weakened or failed roads.
- **100% Performance Index:** Field-proven process with ZERO reported failures in more than 20 years and over 100,000 successful core reinstatements.
- **Improved Logistics:** Pavement reinstatement means simplified scheduling, no temporary patching or repaving and no repeat visits.
- **Faster & Efficient:** After just 30 minutes from the core being reinstated, the road can be safely reopened to traffic.



# Test Hole Excavation and Backfill Requirements (OI 2024-0912)

## Virginia Beach City

- GENERAL i) ii) iii) These requirements are for coring, vacuum excavation, backfilling, and reinstatement of a circular section of pavement to allow for underground utility repairs and spotting. Specifications listed are City of Virginia Beach specific requirements. Differentiations between test/spot holes, used to witness the passing of bore heads as required by Virginia's Underground Utility Damage Prevention Act, and other activities will be called out as applicable. Actual performance of core removal and reinstatement will be in accordance with written instructions and requirements of the system and material used to perform keyhole core reinstatement. Keyhole' is being used as a generic term for cores cut from and returned to pavement to allow performance of subsurface work and inspections. The term keyhole refers to the Utilicor Keyhole system to cut and reinstate pavement cores. Other systems meeting these requirements are acceptable for use. Documentation must be on hand and uploaded showing that any alternate system meets or exceeds the Utilicor Keyhole system.

# Virginia Beach Process continued



- iv) Quality control field inspection and testing requirements, including frequency, shall be in accordance with Contracting Agency requirements or as specified by the cognizant inspector. v) Pavement patching materials will be on hand to perform road patching if emergency situation arises and cores cannot be properly reinstated. vi) Pavement keyhole cores removed shall either be removed from the work site or stored in a safe and secure on-site location. The cores shall be readily available for restoring the pavement after backfilling is complete. vii) When not actively being worked, keyholes will be covered with system approved temporary covers, to allow clearing unnecessary traffic control and enhancing worker safety. (1) If unable to properly back fill and reinstate core by end of workday, keyholes shall be covered by approved covers capable of being secured. Covers will be in place no longer than five (5) calendar days. Inspector will perform visual inspection and approve condition of core hole if removed core is not reinstated within 24 hours of removal. Note: [This is to allow flexibility to back fill and protect keyhole due to unexpected situations, such as weather, traffic conditions, emergency.] (2) A cover cannot be used on overlapping keyholes, unless the sub-grade of both cores is fully back filled and compacted to 95% maximum and the second core is reinstated and allowed to cure for two hours. (3) Steel Plate Ahead (W8-24) warning signs as per VDOT WAPM Section 6G.15 shall be set anytime temporary covers are in place



# Virginia Beach Process Continued



- viii) An Inspection for work acceptance is required to be performed within 96 hours of patch completion. Contact project Inspector to schedule inspection, at least 24 hours in advance. After performance inspection the patch will be in a defect period for one year from date of inspection. Final inspection will be automatically scheduled. Contractor is responsible for any failure or settlement of patch or surrounding material to one year from date of performance inspection. Note: [Ideally the inspector will be present during reinstatement to ensure that core is properly placed, surface finished and bond set. Prompt inspection is intended to minimize the need to repair road damage caused by improperly set core]
- ix) Core drilling rig must be truck, skid-steer or trailer mounted to ensure the necessary power and stable platform for accurate cuts. Note: [Free standing drill rigs require drill and setting anchor bolts, creating their own structural flaws and difficult repair and seal]
- x) Replacement cores from “core farm” are not authorized for use. Original core must be reinstated to proper location.
- xi) Coring shall be performed using a single keyhole coring saw system.



# Virginia Beach Required Materials

- The material and placement requirements within the utility bed and final backfill area shall be in accordance with City of Virginia Beach Utility Test Hole and Backfill Standard Detail C 12. Bonding Agent: The bonding agent shall be a single component cementitious, rapid hardening, high strength waterproof bonding agent conforming to the physical properties: (1) Bond Strength (slant Shear) - 200 psi minimum (70 deg F, 30-minute cure); tested per ASTM C882 (2) Strength – 1500 psi minimum (70 deg F, 60-minute cure); tested per ASTM C109 (3) shall be impervious to water penetration at the joint after application. (4) shall securely bond the undamaged keyhole core to the pavement and shall completely fill the annular space at the joint. (5) The bonding materials shall within 30 minutes at an ambient temperature of 70 degrees Fahrenheit allow the core to support an equivalent traffic load condition of at least three (3) times the AASHTO H-25 standard. (6) The bonding material shall be Utilibond, manufactured by Utilicor Technologies Inc., or Engineer approved equal. Upload approved documentation to Accela Permit documentation and submit copy to Inspector for review before start of keyhole coring. iii) Appropriate color bonding agent is required to match bond with pavement to minimize patched look.





3137 Lynnhaven Drive  
Virginia Beach  
11/14/2024

*TRADITIONAL 1 X 1*





3137 Lynnhaven Drive  
Virginia Beach  
11/14/2024

*12" CORE DRILL*

*WORK WAS PERFORMED IN APRIL OF 2024*



# Traditional 1X1 VS. 12" Core

As seen by the photos :

Traditional requires temporary patch material. Chance to fail.

Core-putting back most of the original road with rock dust and epoxy.



# 2252 General Booth Blvd 10/25/2024

This is a heavily traveled roadway in Virginia Beach. This picture illustrates the abuse this process can handle.





# 2200 Locksley Lane Virginia Beach 11/26/2024

*THIS IS A RECENT CORE DRILLING JOB USING  
STEEL PLATE  
PERFORMED ON 11/26/2024*





# 208 Marsh Island Drive Chesapeake 11/18/2024

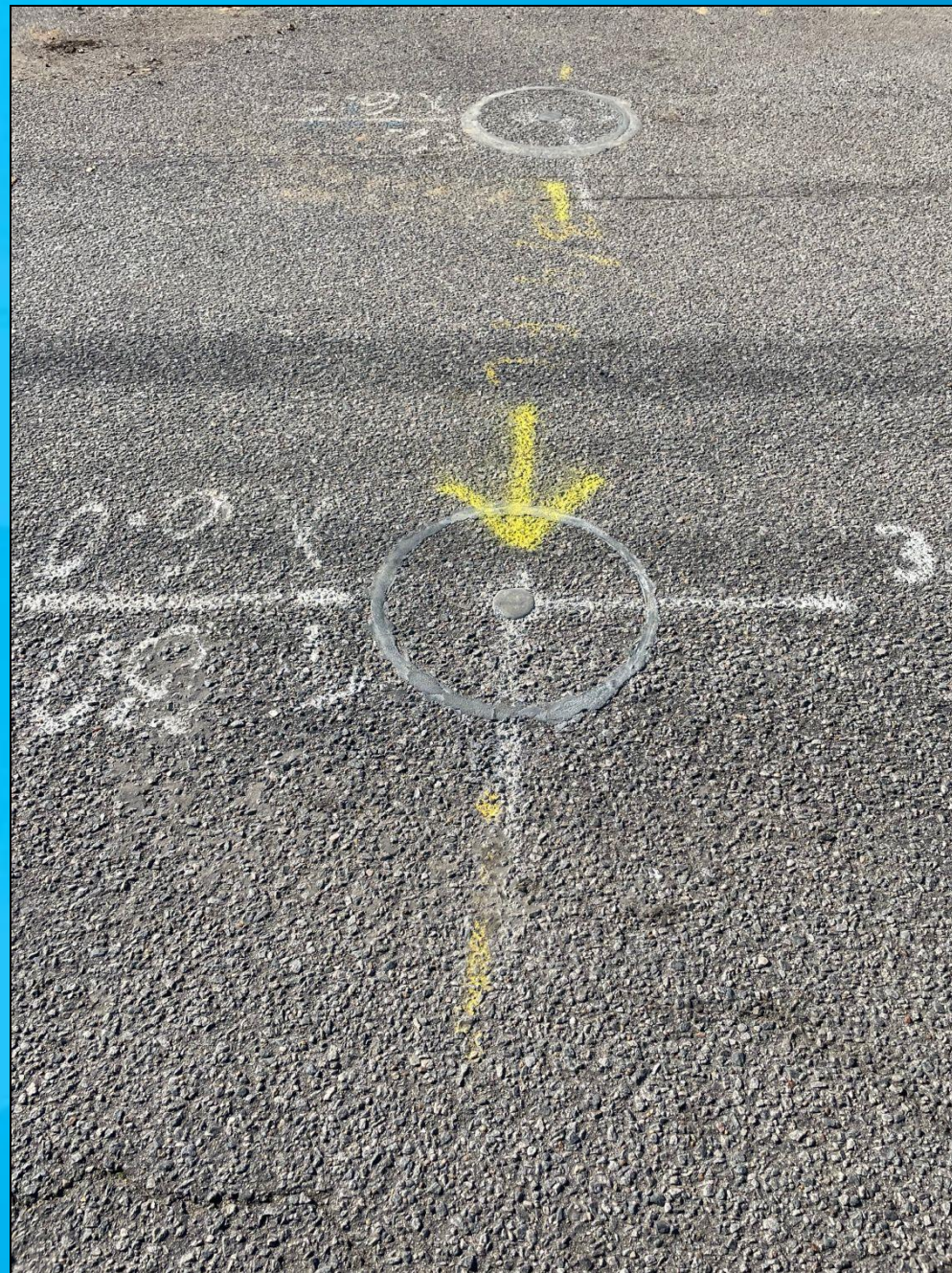
*WORK WAS PERFORMED IN MAY OF 2024*





8453 Radnor Road  
Norfolk  
11/13/2024

*WORK WAS PERFORMED IN MAY OF 2024*





# 24inch Core Drill at major intersection of E. Virginia Beach Blvd & Ballentine Blvd Norfolk Virginia 8/18/2025



# 2508 Queens Elms Pl Virginia Beach 9/11/2025





# 2508 Queens Elms Pl Virginia Beach 9/11/2025





# Q&A SESSION



# THANK YOU

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